IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPELLANT'S MAIN BRIEF ON APPEAL

APPELLANT(S):	Dirk Daecke, et al.	DOCKET NO:	P00,1843-01
SERIAL NO.:	09/697,262	ART UNIT:	2668
FILED:	October 26, 2000	EXAMINER:	Elallam, Ahmed
CONF. NO.:	3837		

TITLE: CIRCUIT ARRANGEMENT AND METHOD FOR DATA TRANSMISSION

Mail Stop Appeal Brief-Patents
Commissioner for Patents
PO Box 1450
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Sir:

In accordance with the provisions of 37 C.F.R. §41.37, Appellant submits this Brief in support of the appeal of the above-referenced application in support of the patentability of claims 1-14, 16, 22 and 23 finally rejected in the Office Action, dated January 12, 2006. A copy of the claims on appeal is attached as Appendix A. A Notice of Appeal was filed on March 23, 2006.

REAL PARTY IN INTEREST

The real parties in interest in this appeal are the assignees, Siemens Aktiengesellschaft (50%), and Infineon Technologies AG (50%), both German corporations, by virtue of the Assignments recorded February 12, 2001 at reel/frame 011516 / 0258, and June 22, 2001 at reel/frame 011927 / 0106.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and no related interferences known to Appellant, Appellant's Assignee, or Appellant's legal representative.

STATUS OF CLAIMS

Claims 1-14, 16, 22 and 23 are on appeal, and constitute all pending claims of the application. These claims were all rejected in the Final Office Action. The

status of the claims is as follows:

Claims / Section	35 U.S.C. Sec.	References / Notes
1-8, 14 and 16	§102(e) Anticipation	• Bartholomew, et al. (U.S. Patent No. 6,400,708).
9-11	§103(a) Obviousness	• Bartholomew, et al. (U.S. Patent No. 6,400,708); and • Tzannes, et al. (U.S. Patent No. 6,522,666).
12, 13, 22 & 23	§103(a) Obviousness	• Bartholomew, et al. (U.S. Patent No. 6,400,708).
Identification of appealed claims		1-14, 16, 22 and 23

STATUS OF AMENDMENTS

Amendment C was filed September 30, 2005, in response to the non-final Office Action dated June 30, 2005. The claim amendments of Amendment C were entered and served as the basis for the Final Office Action. No further amendments to the claims have been made. A copy of these claims is provided in Appendix A.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The use of page and line numbers and reference characters in the drawings is provided by way of example and for purposes of clarity, but is in no way intended to limit the claimed subject matter unless expressly indicated.

The present invention, in a general sense, is directed to a system and appertaining method synchronous transmission of voice and data over a common frame, e.g. SDSL, where all payload services (e.g. ISDN, voice, data) and the transport mechanism share the same overhead infrastructure (synchronization and signalling channel). Specification page / lines 2/4-29.

Independent claims 1-3 are apparatus claims. Claim 1 is directed to a transmission unit and claim 2 is directed to a reception unit. Claim 3 combines the transmission unit and reception unit of the first two claims. Independent claims 4 and 16 are method claims that describe the inventive process.

Accordingly, claim 1 describes a circuit arrangement, comprising: a transmission unit (LT, Figure 3; also NT, for 2-way communication) for inserting

data (e.g., ISDN B-channels, Figure 6, and 5/12-20; 6/1-10) belonging to at least two terminal equipment types or services that are capable of including both voice and data (e.g., ISDN equipment/service) (4/27 – 5/2) in a common frame (e.g. SDSL frame, Figure 4, Figure 6) having a frame length (Figure 4, summation of bit field lengths), said transmission unit (LT) comprising an insertion mechanism (SDSLM, Figure 3) for inserting said data of the at least two terminal equipment types (B1-B4, Figure 6) said data of all terminal equipment types being synchronously inserted into said common frame (e.g., ISDN B-channels into SDSL frame, payload block PO1, Figure 6) with a common channel for operational control (OH, Figure 6) and transmitted with a digital time-division multiplex technique (SDSL).

Claim 2 describes a circuit arrangement, comprising: a reception unit (NT, Figure 3; also LT, for 2-way communication) for dividing a datastream (SDSL-transmission path, Figure 5) transmitted in a frame (SDSL Frame, Figure 4, Figure 6), said frame comprising data (B1-B4, Figure 6) belonging to at least two terminal equipment types or services (E21, E22, Figure 5) that are capable of including both voice and data (e.g., ISDN B-channels, Figure 4, and 5/12-20, Figure 6, 6/1-10), by a transmitter (SDSLM, Figures 3, 5) to at least one terminal equipment type (E21) of said at least two terminal equipment types (E21, E22, 2/10-14); and a switch module (S, Figure 5, 5/26-27) for a purpose-conforming division of said datastream transmitted in said frame (5/27-30), in which a further division onto further terminal equipment of said at least two terminal equipment types or services is undertaken based on control data (Figure 5, 5/27-30).

Claim 3 is simply a combination of the transmission and reception units of claims 1 and 2).

Claim 4 is directed to a method for transmitting a data stream (SDSL-transmission path, Figure 5) in a common frame (SDSL Frame, Figure 4, Figure 6) with a common channel for operational control (OH, Figure 4, 5/21-23) belonging to at least two terminal equipment types or services (E21, E22, Figure 5) that are capable of including both voice and data (e.g., ISDN B-channels, Figure 4, and 5/12-20), comprising the steps of: synchronously inserting data of

said at least two terminal equipment types or services (e.g., ISDN B-channels, B1-B4 Figure 6, and 5/12-20; 6/1-10) into said common frame (SDSL, Figure 4, Figure 6) in a first unit (LT); transmitting said data to a second unit (NT) with a time-division multiplex method (SDSL); and dividing said data stream (SDSL-transmission path, Figure 5) in said common frame (SDSL, Figure 4, Figure 6) to terminal devices of at least two terminal equipment types or services in said second unit (E21, E22, Figure 5).

Claim 16 is directed to a method for transmitting a data stream (SDSL-transmission path, Figure 5) in a common frame (SDSL Frame, Figure 4, Figure 6) with a common channel for operational control (OH, Figure 4, 5/21-23) belonging to at least two terminal equipment types or services (E21, E22, Figure 5) that are capable of including both voice and data (e.g., ISDN B-channels, Figure 4, and 5/12-20), comprising the steps of: synchronously inserting data of said at least two terminal equipment types or services (e.g., ISDN B-channels, B1-B4 Figure 6, and 5/12-20; 6/1-10) into said common frame (SDSL, Figure 4, Figure 6) in a first unit (LT); synchronously transmitting said data to a second unit (NT) with a time-division multiplex method (SDSL); and dividing said data stream (SDSL-transmission path, Figure 5) of said common frame (SDSL, Figure 4, Figure 6) to terminal devices of at least two terminal equipment types or services in said second unit (E21, E22, Figure 5).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues on appeal are as follows:

1. Whether the subject matter of claims 1-8, 14 and 16 are anticipated under 35 U.S.C. §102 by U.S. Patent No. 6,400,708 (Bartholomew);

2. Whether the subject matter of claim 23 is obvious under 35 U.S.C. §103 by Bartholomew;

3. Whether the subject matter of claims 9-11 is obvious under 35 U.S.C. §103 by the combination of Bartholomew and U.S. Patent No. 6,522,666 (Tzannes).

ARGUMENT

ARGUMENT 1–Anticipation by Bartholomew

Examiner's Position: Bartholomew anticipates independent claims 1-4, 14 and 16 of the present invention because all of the elements of the claims are taught by this reference.

In the OA, on pp. 2-3, under numbered paragraph 1, the Examiner stated:

> Regarding claim 1 with reference to figures 1-3, Bartholomew discloses a circuit arrangement (Fig. 2) comprising:
>
> channel bank 31 for inserting data belonging to terminal equipment 29 (telephone) and 25 (computer), Bartholomew further discloses ISDN frame for concurrent voice and data, see column 1, lines 39-49, and column 9, lines 3-20. (Claimed transmission unit for inserting data belonging to at least two terminal equipment types or services that are capable of including both voice and data in a common frame having a frame length);
>
> the channel bank comprising a Multiplexer/Demultiplexer 75 for inserting data of the terminal equipments (telephone 29 and computer 25), and using DS0 slots for transport over a T1 line, see column 12, lines 60-67 and column 13, lines 1-31. In addition Bartholomew discloses having other DS0 for EOC (embedded operations channel) which is used for control (claimed common channel for operational control); see column ii, lines 63-67 column 12, lines 1-19, lines 60-67 and column 13, lines 1-31. (Claimed insertion mechanism for inserting the data of the at least two terminal equipment types, the data of all terminal equipment types being synchronously inserted into the common frame with a common channel with operational control and transmitted with a digital time-division multiple access technique).

With respect to claim 2, on pp. 3, 4, the Examiner stated:

> Regarding claim 2, with reference to figures 1-3, Bartholomew discloses a circuit arrangement (Fig. 2) comprising:
>
> channel bank 31 for dividing a data stream transmitted in a frame by a multiplexer 81 (Fig. 2)

> to a terminal equipment 29, 25, (claimed a reception unit for dividing a data stream transmitted in a frame, the frame comprising data belonging to at least two terminal equipment types or services that are capable of including both voice and data, by a transmitter to at least one terminal equipment of the at least two equipment types);
>
> the channel bank comprising a Multiplexer/Demultiplexer 75 (claimed switch module) for demultiplexing the data stream received to its destined terminal equipment (29, 25), wherein the EOC (embedded operations channel) is used for control (claimed control data); see column 11, lines 63-67; column 12, lines 1-19, lines 60-67 and column 13, lines 1-31. (Claimed a switch module for a purpose-conforming division of data stream transmitted in the frame, in which a further division onto further terminal equipment types or services is undertaken based on control data).

The Examiner referenced the above discussion in rejecting claim 3.

With regard to independent claims 4 and 16, the Examiner stated:

> Regarding claims 4 and 16, with reference to figures 1-3, Bartholomew discloses a method in a circuit arrangement (Fig. 2) for ("synchronously" as in claim 16) transmitting a data stream in a common frame belonging to at least two terminal equipment types or services that are capable of including both voice and data, comprising:
>
> channel bank 31 (claimed first unit) for inserting data belonging to terminal equipment 29 and 25, the channel bank comprising a Multiplexer/Demultiplexer 75 for inserting data of the terminal equipments (telephone 29 and computer 25), and using DS0 slots for transport over a T1 line to a channel bank 39, (claimed second unit) see column 12, lines 60-67 and column 13, lines 1-31, Bartholomew further discloses ISDN frame for concurrent voice and data, see column I, lines 39-49, and column 9, lines 3-20, the frame comprising EOC (embedded operations channel) which is used for control (claimed common channel for operational control); see column 11, lines 63-67; column 12, lines 1-19, lines 60-67 and column

13, lines 1-31. (Claimed synchronously inserting data of at least two terminal equipment types or services into the frame in a first unit, and transmitting the data to a second unit with a time-division multiplex method);

wherein the channel bank 39 (second unit) has a Multiplexer/demultiplexer 81 for dividing data stream (T1) to terminal devices of terminal equipment 3, 7 (Figure 1). (claimed dividing data stream in said common frame to terminal devices of at least one terminal equipment type in the second unit).

In response to the Applicant's arguments in the previous response, the Examiner stated, on pp. 9-11:

Applicants stated on page 8, "With regard to the non-recitation of an SDSL link in claims 1,4, 14 and 15, the discussion with respect to these claims utilized an SDSL link for purposes of clarity, however, the claims are intended to be interpreted broadly without such a limitation". Examiner point out that utilizing a SDSL for clarity is not equivalent to reciting the SDSL in the claim.

Applicants also stated on page 9:

"The description of the present application specifies the notion of synchronous transmission (with references to page/lines):

Finally, the object is also achieved by a method for transmitting a data stream in a frame belonging to at least one terminal equipment type, comprising the steps of synchronously inserting data of all terminal equipment types into the frame in a first unit; (2/27-28).

a traditional telephony connection, instead of the ISDN connection, can be synchronously transmitted in the SDSL frame... (2/27-28).

The narrow band and broadband data of the SDSL frame are transmitted synchronously in time-division multiplex between a first unit LT, a network node and the network termination NT (4/16-18).

The data transmission of the data in an SDSL frame occurs synchronously in time-division multiplex. The synchronization takes place with the assistance of the SDSL clock (5/3-5).

This is what is intended with respect to the synchronization contained in present claims 1, 4, 14 and 15."

Examiner notes that the first passage (2/27-28) and the second passage (2/27-28) relayed upon are presented in the summary of the invention and thus do not clearly explain the disputed feature of "synchronous insertion".

The third passage (4/16-18) deals with synchronous transmission in time-division multiplex, Examiner notes that the synchronous transmission in tithe-division multiplex is different than the "synchronous insertion" concept.

The fourth passage (5/3-5) also deals with the data transmission in SDSL frame occurs synchronously in time division multiplex. The deals with synchronous transmission in Time division multiplex.

Examiner notes that these passages do not contain the recited "synchronous insertion", and therefore the claimed "synchronous insertion" should be interpreted as "synchronous transmission" instead. Therefore the transmission of concurrent voice and data of Bartholomew using the Multiplexer/Demultiplexer reads on the claimed limitations "synchronous insertion".

Applicants argue on page 10 and 11 that Bartholomew fails to teach or suggest the synchronous insertion as claimed in claims 1, 4, 14 and 15, as well as new claims 22 and 23."

Examiner notes, with the exception of claims 22 and 23, that applicant argument is not related to the claimed subject matter of claims 1, 4. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicants argue on page 12 that Bartholomew does not transmit an ISDN service. However it is not clear to what claim such argument is intended for, because most claims do not recite the ISDN service.

Applicants provided a lengthy argument on pages 13-17 (line 12), however Applicant fails to address specific claims, and Examiner can't relate to a specific claim.

Appellants' Position: Bartholomew does not anticipate independent claims 1-4, 14 and 16 of the present invention because all of the elements of the claims are not taught by this reference.

The present invention introduces a new method for synchronous transmission of voice and data over a common frame, e.g., SDSL, where all payload services (e.g., ISDN, voice and data) and the transport mechanism share the same overhead infrastructure (i.e., synchronization and signalling channel), which is distinguished over the prior art cited by the Examiner, which uses a separate channel inside of the payload region.

Bartholomew fails to teach the insertion of data of at least two terminal equipment types in a common frame with a common control channel for operational control, as is required by all independent claims of the application.

Separate vs. Common Control Channels

According to all independent claims of the invention, a common frame with a common channel for operational control exists for data of at least two terminal equipment types that are inserted in a common data frame that is transmitted or received. This control and maintenance channel is shared by the frame as well as by the services that are transmitted as payload data, which is not taught by Bartholomew (teaching separate control channels).

The concept of a joint operational control of payload services and the transmission frame was discussed in the Specification at 5/6-11 and 6/7-16. Namely, the Specification at 6/7-10 states:

> The operational control information of the respective ISDN connection are transmitted in the overhead OH of the SDSL frame, where this control information is divided into a part relating to the SDSL transmission path and into a further part that is dependent on one or more transmitted services.

Thus, the operational control concept is fundamentally different from that disclosed by Bartholomew. Bartholomew uses ISDN frames according to the well-known European Telecommunications Standards Institute ETSI Standard TS

101 080 containing an EOC as a transport mechanism for its payload. The functionality of this EOC only refers to the maintenance of the ISDN frames. These maintenance messages are specified in ETSI TS 101 080, A.8.3.3 and Annex A2. This messaging channel does not have any relationship with the services transmitted within the payload. Bartholomew states, at 9/17-20:

> The switch communicates with various ISDN devices in the line, using the EOC channel for synchronization, maintenance and testing purposes.

Bartholomew's method uses a separate voice signaling channel inside the 16 kbits/s compressed voice data that is put at the place of the 16 kbits/s ISDN D-Channel. The separate voice signaling is described in Bartholomew's patent in the Abstract:

> The voice communications on the D-channel utilize in-band call set-up signaling and appropriate CODECs for digital communications compressed to the low D-channel rate.

Bartholomew goes on to state:

> The voice communications on the signaling channel utilize in-band call set-up signaling and appropriate CODECs for digital communications compressed to the low signaling channel rate. A channel bank on the network edge includes a multiplexer/demultiplexer, to combine a number of active signaling channel voice communications into one bearer channel for transport to a switch module, for example, through a DS0 to a module in an end office telephone switch (4/56-64).
>
> ...
>
> The interface 28 also performs some call-set up signaling over the D-channel, in a manner similar to a portion of the D-channel signaling performed by the TAU 15. In particular the interface 23 sends and receives normal D-channel signaling relating to line states, e.g. off-hook, ringing, ring-tip, on-hook, etc. However in the presently preferred embodiment, once the interface 28 has signaled seizure of the D-channel on the line 11, the interface provides a pass-through for the other signaling to and from the telephone 29. For example on an outgoing call, the interface 23 detects an off-hook by the telephone 29. The interface

> signals this condition over the line and establishes a channel to the switch 37. The switch sends dial-tone in band, and the interface 28 passes the dial-tone signal to the telephone 29 for presentation to the caller (7/45-59).

These excerpts from Bartholomew's patent description show that the EOC inside the ISDN frame is only used for maintenance purposes of the transmit medium.

However, the services inside the payload, the 16 kbits/s compressed voice and the 2 x 64 kbits/s data are *independent of* the ISDN frame and they use *independent signaling channels*, not a common channel, as required by the independent claims of the present invention. In Bartholomew, the voice signaling is carried inside the 16 kbits/s compressed voice channel. Bartholomew discloses one EOC link for each service, which are transmitted in parallel:

> The EOC and D channels are combined on another DS0 within the T1 link. [9/7-9.]
>
> The switch communicates with various ISDN devices in the line, using the EOC channel, for synchronization, maintenance and testing purposes. [9/17-20.]
>
> The EOC channel also does not go through to the other end of the point-to-point circuit, because the device at the opposite end has no need for maintenance related communications with the device(s) at the customer premises.
>
> From the customer premises 1_3 to the hub switch 41, the channel banks, T1s and DS0 connections actually provide fractional T1 service from the customer premises to the packet switched network 45. Fractional T1 is a service that meets a customer requirement for high data rates, which are still less than full T1. The T1 or equivalent DS1 rate represents a combination of 24 of the 64 kb/s DS0 or B channels, at a total data rate of 1536 Mb/s. Customers are assigned predetermined portions of the T1 capacity. For example, in the New York area, fractional T1 is offered in increments of two DS0 channels beginning at 128 kb/s (2 channels) up through a maximum of twelve channels, excluding the ten channel variation. In a typical implementation of fractional T1, the carrier

> company connects a full T1 at the customer premises. Within that T1, the carrier assigns X number of DS0s (2, 4, 6, 8 or 12) that the customer purchases for the desired digital bandwidth. [9/49-10/3.]
>
> Two of these time slots transport the two bearer (B) channels. The other slot transports the embedded operations channel (EOC) and the data (D) channel for the one subscriber's ISDN service. [10/51-54.]

Since Bartholomew fails to teach or suggest the use of the insertion of data of at least two terminal equipment types in a common frame with a common control channel for operational control, as is required by all independent claims of the application, it cannot anticipate the present invention.

The Examiner, on p. 9 of the OA noted that utilizing an SDSL in the discussion for purposes of clarity is not equivalent to reciting SDSL in the claim. The Examiner is correct in noting that the claim terms can be interpreted broadly and that argued limitations and aspects described in the Specification are not to be construed as limitations to the claim. However, the Examiner is mistaken in assuming that the related discussion was presented as an argument that the broad independent claims required an SDSL protocol / frame—to the contrary, claims 22 and 23 specifically limit the claim scope to an SDSL frame. The discussion was by way of illustration, and none of the discussion included a reliance on attributes that would necessitate an SDSL frame. What was argued is that the reliance on Bartholomew was improper because it fails to teach or suggest the use of the insertion of data of at least two terminal equipment types in a common frame with a common control channel for operational control, as is required by all independent claims of the application.

Since this aspect is a limitation required by all independent claims, Bartholomew cannot anticipate the present invention.

Synchronous Insertion & Transmission

Furthermore, the independent claims of the present invention require that the data of all terminal equipment types are synchronously inserted into a common frame and transmitted with a digital time-division multiplex technique.

Bartholomew fails to teach or suggest the element that data of all terminal

equipment types are synchronously inserted in the common frame with a common channel for operational control and synchronously transmitted.

As discussed above, the Examiner asserted, on pp. 2-3, that Bartholomew:

> further discloses ISDN frame for concurrent voice and data, see column 1, lines 39-49, and column 9, lines 3-20. (Claimed transmission unit for inserting data belonging to at least two terminal equipment types or services that are capable of including both voice and data in a common frame having a frame length)...
>
> In addition Bartholomew discloses having other DS0 for EOC (embedded operations channel) which is used for control (claimed common channel for operational control); see column ii, lines 63-67 column 12, lines 1-19, lines 60-67 and column 13, lines 1-31. (Claimed insertion mechanism for inserting the data of the at least two terminal equipment types, the data of all terminal equipment types being synchronously inserted into the common frame with a common channel with operational control and transmitted with a digital time-division multiple access technique).

The Examiner noted, on p. 9 of the OA that the Applicants' description of the synchronous transmission (and insertion) provided at 2/27-28, 4/16-18, and 5/3-5 of the application failed to adequately deal with the issue of "synchronous insertion" and that therefore the claimed "synchronous insertion" should be interpreted as "synchronous transmission" instead, and that the transmission of concurrent voice and data of Bartholomew using the Multiplexter/Demultiplexer reads on the claimed limitations "synchronous insertion".

The Examiner noted that the first passage relied upon (2/27-28) are presented in the summary of the invention and thus do not clearly explain the disputed feature of "synchronous insertion".

Contrary to the Examiner understanding *synchronous insertion and transmission* represent one process, which means that the data and the frame have one common timing reference. This can be achieved by locking these

processes to the same network clock. It is clear, by reviewing, e.g., Figures 4 and 6 of the present invention that there is an insertion of the data (e.g., B1, B2, Z1, Z2, and operation and control data in OH) in the data that is intended to be transmitted synchronously. Here, the wording used clearly means "synchronous insertion into the frame and (synchronous) transmission".

On page 10, lines 14-16, the Examiner interprets the term "synchronous insertion" by comparing it with Bartholomew's method where data and voice services are transmitted over one DSL link.

> Therefore the transmission of concurrent voice and data of Bartholomew using the Multiplexer/Demultiplexer reads on the claimed limitations "synchronous insertion"

Merriam Webster's 11th Collegiate Dictionary (computer-version, 2003) defines the term "synchronous" (when referring to digital communication as:

> 5 : of, used in, or being digital communication (as between computers) in which a common timing signal is established that dictates when individual bits can be transmitted and which allows for very high rates of data transfer

Furthermore, E.A. Lee and D.G. Messerschmitt's "Digital Communications" (Kluwer, p. 700) specifies "synchronous" more precisely as a "common time base at physically separated points".

The Examiner asserts, at 10/14-16 of the OA, that the term "synchronous" should be used in the sense that data and voice services are transmitted simultaneously over the same DSL link, thereby concluding (10/17-21 & 11/1-2):

> Applicants argue on page 10 and 11 that Bartholomew fails to teach or suggest the synchronous insertion as claimed in claims 1, 4, 14 and 15, as well as new claims 22 and 23.
>
> Examiner notes, with the exception of claims 22 and 23, that applicant argument is not related to the claimed subject matter of claims 1, 4. Although the claims are interpreted in the light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns,* 988 F.2d 1181,26

USFQ2d 1057 (Fed.Cir. 1993).

However, as claimed, the term "synchronous" is used in accordance with its plain and ordinary meaning, as provided, e.g., by the dictionary definitions noted above. In other words, the term "synchronous" means that the transmitted payload data and the frame have a common timing reference.

The synchronization of the payload services and the frame clock represents a special case, because typically the payload clock is not synchronized to the network clock. Although the Examiner argued that the voice and data services in Bartholomew's invention are synchronized to the clock of the ISDN frame, Bartholomew does not provide any teaching or suggestion related to such synchronization issues.

The HDSL link as disclosed in Bartholomew is asynchronous (plesiochronous) whereas the inventive link is synchronous, and by way of example only for the broad claims, an exemplary synchronous SDSL link has been explained. There is a significant difference between Bartholomew's asynchronous (plesiochronous) link and the inventive synchronous link. The synchronization takes place with the assistance of a common (e.g., an SDSL) clock. In this way the termination equipment at both ends is in sync and, for example, the ISDN clock which becomes identical to the SDSL clock, is available. Again, the broadest claims and arguments are not limited to an SDSL implementation... these are only discussed by way of example, and the same arguments apply to any non SDSL implementation that makes use of such a synchronous link.

For example, in the method specified in the HDSL standard, the synchronization signal is transmitted inside the payload. Bartholomew transmits voice-channel specific synchronization signal inside the payload, as disclosed at 9/17-20, "The switch communicates with various ISDN devices in the line using the EOC channel, for synchronization, maintenance and testing purposes."

Again, it is important to note that the application does not claim to invent the concurrent transmission of voice and data over a DSL link—in fact, this concept (very similar to that of Bartholomew's patent) where data and voice

services are transmitted over one DSL link was acknowledged as prior art. See the Specification at 1/23-30 and Figure 2 of the application, where ISDN and broadband data transmitted in an HDSL frame.

For these reasons, Bartholomew fails to teach or suggest the synchronous insertion and transmission as claimed in claims 1-4, 14 and 16.

ARGUMENT 2–Obviousness by Bartholomew

Examiner's Position: Bartholomew obviates independent claim 23 of the present invention because, given the teaching of Bartholomew it would have been obvious to a person of ordinary skill in the art to use an SDSL frame so that ISDN services could be provided.

In the OA, on p. 8, with regard to claim 23, the Examiner stated:

> Regarding claim 23, Bartholomew discloses ISDN connections in a frame as indicated above with reference to parent claim 1, the connection belonging to at least two equipment type or services, however Bartholomew does not specify that the frame is a symmetric digital subscriber line frame. However, symmetric digital subscriber line frame is a well-known established standard. It would have been obvious to an ordinary person of skill in the art, at the time the invention was made to use an SDSL frame instead of ISDN frame for carrying Bartholomew voice and data so that the Bartholomew ISDN services can be provided using the well SDSN standard. The advantage would be the provisioning of adaptive rate that the SDSL standard provides.

Appellants' Position: The distinction between the transmission of an ISDN service and simply using an ISDN format is not an obvious variation.

As previously discussed, the distinction between transmission of an ISDN service and simply using the ISDN format is important. Bartholomew uses the ISDN format in order to transport compressed traditional voice service and 2 x 64 kbits/s data services transparently. However ISDN service is more than just digitized voice service. ISDN service comprises the following: 2 x 64 kbits/s B-channels for digitized voice, 16 kbits/s D-channel for higher layer signaling, control messages and a synchronous ISDN clock signal.

The present invention permits the ISDN frame to be discarded and the 2 x

B voice-channels and the higher layer signaling D-channel may be transmitted as payload inside the SDSL frame. The ISDN specific EOC messages can be transmitted over the common frame, e.g., SDSL, EOC, not over the ISDN EOC, which has also been discarded.

The frame word of the ISDN frame can be eliminated in a transmission of the SDSL frame. The information contained in the overhead channel in the ISDN connection such as status information or a transmission control are already contained in the SDSL frame (page 5 lines 5-8). Hence, Bartholomew discloses the use of an ISDN physical layer, but no ISDN service, whereas the present invention permits the use of an ISDN service, but has no ISDN physical layer.

In the OA, on p. 11, the Examiner stated that the above arguments that Bartholomew does not transmit an ISDN service was unclear because most claims do not recite the ISDN service.

The Appellants are not making reference to the ISDN aspects above because the independent claims require this as a limitation—the reason that this is being discussed is to clarify the distinction between the claim language that is used with regard to the synchronous insertion and transmission of the present invention, and the disclosure of Bartholomew related to its ISDN implementation. Given Bartholomew's implementation, it could not be teaching or suggesting the synchronous aspects of the independent claims. Bartholomew, while disclosing ISDN framing, does not disclose a system that could provide the type of synchronicity provided by an ISDN service.

An ISDN service comprises the following: 2 x 64 kbits/s B-channels for digitized voice, 16 kbits/s D-channel for higher layer signaling, control messages and a synchronous ISDN clock signal. An ISDN service refers to higher protocol layers and it is independent from a specific data link layer. The characteristics of the ISDN B-Channel and the D-Channel (and its signaling procedures) are defined in ITU-T 1.412. (Note: An ISDN service does not require an ISDN frame as specified in ETSI TS 102 080 for transmission over the physical layer).

If ISDN services are transmitted over the telephony cable using 2BIQ

modulation, ISDN frames as specified in ETSI TS 102 080 can be used. The data rate of this transmission is 160 kbits/s, where 16 kbits/s are required for the framing. The payload capacity of basic access ISDN is 144 kbits/s corresponding to 2 x 64 kbits/s (B-channel) + 16 kbits/s (D-channel).

Typically ISDN frames are used to transport ISDN service, but they can also be used for different purposes, as shown in Bartholomew's patent. Bartholomew uses the ISDN frame and the ISDN format, but, contrary to the Examiner's interpretation, does not transmit an ISDN service.

Instead of the 144 kbits/s (=2xB + D) ISDN voice service, Bartholomew uses the payload fields to transmit a different service than ISDN, namely: 16 kbits/s compressed voice (instead of the ISDN D-channel) and 2 x 64 kbits/s data services (instead of the ISDN B-channels), that fit into the ISDN frame. A D-channel is an ISDN specific signaling channel at 16 kbits/s. This channel carries the signaling according to DSS1 protocol for the calls established through the B-channels. The D-channel is specified in the ISDN standards. A 16 kbits/s compressed voice channel, as described in Bartholomew's patent, is not a D-Channel. It only occupies the payload fields intended for the D-channel in an ISDN frame. Therefore, while Bartholomew discloses the use of an ISDN frame, it does not disclose an ISDN service because it replaces an essential element required in an ISDN service. The present invention permits the transmission of an ISDN service inside, e.g., an SDSL frame. Bartholomew uses ISDN framing for compressed voice and data transmission.

For these reasons, Bartholomew fails to teach or suggest the provision of data belonging to at least two terminal equipment types or services within an ISDN service that are transmitted inside an SDSL frame as claimed in claims 23.

ARGUMENT 3–Obviousness over Bartholomew and Tzannes

Examiner's Position: The combination of Bartholomew and Tzannes obviates claims 9-11 of the present invention because all of the elements of the claims are taught by this combination of references and it would have been obvious to combine.

The Examiner rejected claims 9-11 over the combination of Bartholomew

and Tzannes, stating (on pp. 6-7), under numbered paragraph 2:

> Regarding claims 9 and 10, Bartholomew discloses substantially all the limitations of base claim 4, in addition as discussed above with reference to claim 5, Bartholomew discloses the use of a single eoc channel for controlling both concurrent data and voice, however Bartholomew does not explicitly disclose providing bits for operational control in data belonging to the terminal equipment types or services and arranging bits outside of a payload data region provided for the terminal equipment.
>
> However, Tzannes discloses in the same field of endeavor, providing bits for operational control in data belonging to a terminal equipment type and arranging bits outside of a payload data region provided for the terminal equipment in a frame format. See column 3, lines 14-44.
>
> Therefore, it would have been obvious to an ordinary person of skill in the art, at the time the invention was made to implement the EOC overhead method taught by Tzannes in Bartholomew system so that communication of concurrent voice and data by the terminal equipments of Bartholomew can be provided using ISDN digital subscriber lines standards.
>
> Regarding claim 11, as indicated above with reference to claim 10, Bartholomew discloses providing bits for operational control in data belonging to a terminal equipment type (claimed allocating bits for operational control to an operating eoc channel, and that the eoc is embedded in a portion of the overhead channel in accordance with the established standards. (Examiner interpreted the portion of the overhead channel of having the eoc bits as being the claimed addressing the bits for operational control via a sub-address in a message format of the operating channel).

In responding to the Applicants' arguments, the Examiner further stated, on p. 11:

> As to claims 9-11, Applicants argument refers to ISDN, voice, SDSL EOC in arguing the patentability of claims 9-11. However these claims do not recites the ISDN, voice, SDSL EOC. Limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed.

Cir. 1993).

Examiner believes, given the broadest reasonable interpretation of claim limitations, the rejection above is proper.

Appellants' Position: Claims 9-11 of the present invention is non-obvious over the combination of Bartholomew and Tzannes because the combination fails to teach or suggest all elements of the claims to one of ordinary skill in the art.

The Examiner acknowledges Bartholomew's lack of explicit disclosure of providing bits for operational control in data belonging to the terminal equipment types or services and arranging bits outside of a payload data region provided for the terminal equipment. But the Examiner states that Tzannes makes such a disclosure at 3/14-44.

The EOC in Tzannes' patent is only specified for use of signaling for the transmit medium, but is not shared with the payload services.

Claim 9 address the fact that payload voice services (ISDN, digitized voice) and the transmit medium SDSL share only one EOC inside the common (e.g., SDSL) frame. As described in Bartholomew and discussed above, each service and the transport medium have their own EOCs which are each realized as a separate bitstream. The EOCs of the voice service are carried separately in the payload, whereas the control according to the present claims, as amended, utilizes an embedded operating channel that is distinguished from that of Bartholomew. The assignment of the logic EOC channels between the terminations may be made via addressing.

Therefore, Bartholomew, even in combination with Tzannes, fails to teach or suggestion a common frame with a common channel for operational control, as required by the claims of the present application.

Appellants note that the invention is not intended to broadly cover the general concept of multiplexing of voice and other data into a DSL link, nor does it broadly cover the eoc signaling channel per se. Instead the invention relates to synchronous transmission of voice and data over a common frame, e.g., SDSL, where all payload services (e.g., ISDN, voice, data) and the transport mechanism

share the same overhead infrastructure (synchronization and, operational and control, e.g., eoc, signaling channel).

The present Specification addresses a system that is capable of transmitting multiplexed voice and data services in a common frame with a common channel for operational control (e.g., over a DSL link). The Specification (p. 1) briefly describes state-of-the-art techniques. In lines 23-30 and in Figure 2 the transport of ISDN voice services and broadband data over an HDSL link (see ETSI HDSL Standard TS 101 135, Section 7.7, pp. 111-117, November 1998) is referred to. This standard specifies how an ISDN channel (2 B + D) and 2048 kbits/s broadband data are multiplexed into HDSL frames. Bartholomew also discloses using a method for multiplexing data and voice services into a DSL link. But there are significant differences between Bartholomew's method in the HDSL standard and the present invention.

Annex 7.7 of the HDSL standard and the present invention describe different methods for transmission of broadband data and ISDN service over a HDSL or SHDSL link using a multiplexing method. Bartholomew uses the ISDN frame format to transmit 64 kbits/s data service and 16 kbits/s compressed voice data, but the payload in Bartholomew's system is not an ISDN payload. Bartholomew's system is therefore not able to deliver, e.g., an ISDN service. The system of the present invention is designed to be capable of transmitting ISDN service and/or a traditional voice service.

The new ideas of the method described in these claims can be illustrated by a comparison to state-of-the-art concepts of signalling channels in a DSL link: in this case, the frame has its own control and maintenance channel, while each data or voice service that is transmitted as payload data has its own control channel. The control channels of the payload data are transmitted together with the payload data in the payload. The Specification of the present application provides a description of the related art to ISDN transmission over HDSL. In this example the voice (ISDN) has a separate control channel inside the payload region.

Bartholomew's method uses <u>separate</u> control channels for his voice

service and for the frame. The control signalling of the voice is transmitted inside the payload data together with the voice data. In this way Bartholomew's patent serves as another example of data transmission using separate control channels.

The fundamental differences of the claimed method, using a common signalling channel in the frame, become apparent if the claims are being read in comparison with the state-of-the-art technologies.

Claim 9 requires that the operational control signalling of a payload service, e.g., data or voice ("data belonging to a terminal equipment type"), are arranged outside of the payload data region. In contrast, state of the art methods arrange this operational control signalling inside the payload data region together with the payload service.

Claim 10 specifies the transmission of the operating control bits by transmission in the overhead of the frame.

Claim 11 further specifies the transport mechanism of operational control bits. This claim shows that there is an operating control EOC channel that transports the control data belonging to each service. Several payload services and the transport mechanism share the one control channel. On the other hand, in the state of the art methods each service has its own control channel and therefore the allocation of the sender to the recipient of these messages is obvious. However, if several services share the same control channel, a special addressing scheme is needed to allocate the messages. Therefore, Claim 11 specifies that the addressing of the bits for operational control is made by introducing sub-addresses in the message format of the operating channel.

An implementation of this new common control channel is described in the specification of our invention by the transmission of ISDN voice in SDSL frames. A joint control channel according to claims 9,10 and 11 is used to transmit the bits for operational control. For example, an implementation according to these claims is described in the specification as:

> The information contained in the overhead channel in the ISDN connection such as status information or a transmission control are already contained in the

> SDSL frame. Among other things, an eoc channel, also be referred to as an "operating channel", and that is synchronized with the ISDN data stream, is provided in the ISDN overhead channel. This eoc channel serves as the control channel between network equipment for operational purposes. [5/6-11.]
>
> The operational control information of the respective ISDN connection are transmitted in the overhead OH of the SDSL frame, where this control information is divided into a part relating to the SDSL transmission path and into a further part that is dependent on one or more transmitted services. [6/7-10.]
>
> Figure 7 shows an embodiment of the eoc address expansion necessary for the addressing of the individual ISDN connections or, respectively, traditional telephone connections. To this end, the address of the eoc channel has an auxiliary address field attached to it. The auxiliary address field comprises the components service ID and service No that are needed for an unambiguous addressing of the respective connection [6/11-16.]

The eoc channels are not multiplexed into timeslots. Instead there are only logic channels where the assignment of the messages to the respective receipients is made via addresses in the messages.

All services transmitted according to the present invention operate synchronously (see section III), whereas the HDSL link is asynchronous (plesiochronous) asynchronous. In Bartholomew, the voice services transmitted over the ISDL and the T1 are not synchronized.

With respect to claims 9-11, the control channel for the service transmitted as payload (ISDN, voice) is arranged outside the payload region in the frame overhead. Multiple payload services and the SDSL transport mechanism share only one EOC, which is, e.g., the SDSL EOC. The Specification states, *"The bandwidth of the payload data can be expanded by relocation of operational bits"* into the frame (page 2 lines 25, 26). In contrast to this method, for the above described ISDN transport over HDSL, its own signaling channel is set up inside the payload.

According to the claims in the present invention, instead of setting up a separate and appertaining signaling channel in the payload region for each voice channel, as it is done in Bartholomew or in the HDSL standard, different services share the common frame, e.g., SDSL, EOC. This means that the signaling of the payload (ISDN or traditional voice service) shares the control channel of the transport mechanism (SDSL). This control channel is in the frame and not in the payload (Specification at 5/6-11; 6/7-16).

In these appertaining claims of the present invention, the EOC channels are not multiplexed into timeslots. Instead there are only logic channels where the assignment of the messages to the respective recipients is made via addresses in the messages.

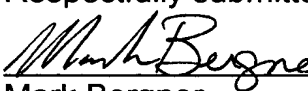
For these reasons, claims 9-11 are not obvious over Bartholomew in vew of Tzannes.

CONCLUSION

For the above reasons, Appellants respectfully submits that the Examiner is in error in law and in fact in rejecting the claims of the present application based on the teachings of the above-discussed references. Reversal of the rejection of all of those claims is justified, and the same is respectfully requested.

This Brief is accompanied by a check in the amount of $500.00, as required by 37 C.F.R. §41.20(b)(2). If necessary, the Commissioner is hereby authorized to charge any additional fees which may be required to account No. 501519.

Respectfully submitted,



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Mark L Bergner

APPENDIX A
CLAIMS INVOLVED IN THE APPEAL

1. (previously presented) A circuit arrangement, comprising:

a transmission unit for inserting data belonging to at least two terminal equipment types or services that are capable of including both voice and data in a common frame having a frame length, said transmission unit comprising an insertion mechanism for inserting said data of the at least two terminal equipment types, said data of all terminal equipment types being synchronously inserted into said common frame with a common channel for operational control and transmitted with a digital time-division multiplex technique.

2. (previously presented) A circuit arrangement, comprising:

a reception unit for dividing a datastream transmitted in a frame, said frame comprising data belonging to at least two terminal equipment types or services that are capable of including both voice and data, by a transmitter to at least one terminal equipment type of said at least two terminal equipment types; and

a switch module for a purpose-conforming division of said datastream transmitted in said frame, in which a further division onto further terminal equipment of said at least two terminal equipment types or services is undertaken based on control data.

3. (original) A circuit arrangement, comprising a transmission-reception unit which comprises said transmission unit of claim 1, and said reception unit of claim 2.

4. (previously presented) A method for transmitting a data stream in a common frame with a common channel for operational control belonging to at least two terminal equipment types or services that are capable of including both voice and data, comprising the steps of:

synchronously inserting data of said at least two terminal equipment types or services into said common frame in a first unit;

transmitting said data to a second unit with a time-division multiplex method; and

dividing said data stream in said common frame to terminal devices of at least two terminal equipment types or services in said second unit.

5. (previously presented) A method according to claim 4, further comprising the step of depositing data for operational control of connections to which at least two terminal equipment types or services that is capable of including both voice and data are connected in a single operating eoc channel of said frame.

6. (original) A method according to claim 5, wherein said connections are telephony connections, ISDN connections or broadband connections.

7. (original) A method according to claim 4, further comprising the step of filling a payload data region available in a frame in a terminal equipment-specific manner depending on a transmission rate of a transmission link.

8. (original) A method according to claim 4, further comprising the step of connecting a plurality of terminal equipment of at least one terminal equipment type to a transmission-reception unit.

9. (previously presented) A method according to claim 4, further comprising the steps of:

providing bits for operational control in said data belonging to said terminal equipment types or services; and

arranging said bits outside of a payload data region provided for said terminal types or services.

10. (original) A method according to claim 9, wherein said bits for operational control are arranged in an overhead of said frame.

11. (original) A method according to claim 10, further comprising the steps of:

allocating said bits for operational control to an operating eoc channel; and

addressing said bits for operational control via a sub-address in a message format of said operating channel.

12. (original) A method according to claim 4, further comprising the step of accepting data of a plurality of ISDN connections in said frame, said frame being a symmetric digital subscriber line frame.

13. (original) A method according to claim 4, further comprising the step of accepting data of a plurality of traditional telephony connections in said frame, said frame being a symmetric digital subscriber line frame.

14. (previously presented) A method according to claim 4, wherein said step of transmitting said data comprises transmitting said data of a symmetric digital subscriber line frame synchronously on a transmission link between said

first unit, which is a network node, and said second unit, which is a network termination unit with a time-division multiplex method.

15. (canceled).

16. (previously presented) A method for transmitting a data stream in a common frame with a common channel for operational control belonging to at least two terminal equipment types or services that are capable of including both voice and data, comprising the steps of:

synchronously inserting data of said at least two terminal equipment types or services into said common frame in a first unit;

synchronously transmitting said data to a second unit with a time-division multiplex method; and

dividing said data stream of said common frame to terminal devices of at least two terminal equipment types or services in said second unit.

17-21. (canceled).

22. (previously presented) The circuit arrangement according to claim 1, wherein the common frame is an SDSL frame.

23. (previously presented) The circuit arrangement according to claim 22, wherein the data belonging to at least two terminal equipment types or services are provided within an ISDN service that are transmitted inside of the SDSL frame.

APPENDIX B
EVIDENCE APPENDIX

There is no additional evidence entered and relied upon for this appeal.

APPENDIX C
RELATED PROCEEDINGS APPENDIX

There are no related proceedings associated with this appeal